Claims

What is claimed is:

1. An ink composition comprising:

from about 0.1 to 5% by weight of a water-soluble polyurethane;

from about 0.1 to 15% by weight of a 1,2-alkyldiol having 5-9 carbon atoms; and

from about 0.5 to 6% by weight of a pigment;

2. The ink composition of claim 1 wherein the pigment is present at a concentration in the range of about 2 to 4% by weight, the water-soluble polyurethane is present at a concentration in the range of about 0.5 to 3% by weight and the 1,2-alkyldiol is present at a concentration in the range of about 1 to 8% by weight.

3. The ink composition of claim 1 wherein the water-solubility limit of the water-soluble polyurethane is greater than about 5% at 25°C.

4. The ink composition of claim 1 wherein the water-soluble polyurethane has a weight average molecular weight of less than about 15,000 Da.

5. The ink composition of claim 1 wherein the water-soluble polyurethane has an acid number in the range of about 30 to 70.

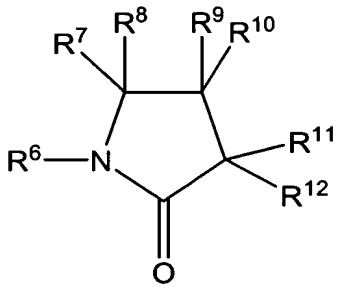
6. The ink composition of claim 1 wherein the 1,2-alkyldiol is 1,2-pentanediol.

7. The ink composition of claim 1 wherein the 1,2-alkyldiol is 1,2-hexanediol.

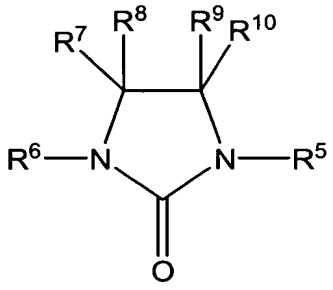
8. The ink composition of claim 1 further comprising a water-miscible organic co-solvent or a mixture of water-miscible organic co-solvents.

9. The ink composition of claim 8 wherein the water-miscible organic co-solvent or mixture of water-miscible organic co-solvents is present at a concentration in the range of about 0.5 to 20%.

10. The ink composition of claim 8 wherein the water-miscible organic co-solvent is a 2-pyrrolidone derivative having formula (V) or an imidazolidinone derivative having formula (VI):



(V)

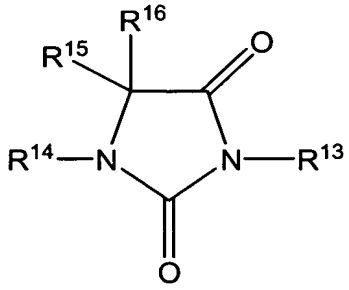


(VI)

wherein R^5, R^6, R^7, R^8, R^9, R^{10}, R^{11} and R^{12} are each independently selected from the group consisting of hydrogen and C_1-C_6 aliphatic groups; and

wherein any C_1-C_6 aliphatic groups are optionally substituted with one or more hydroxyl groups.

11. The ink composition of claim 8 wherein the water-miscible organic co-solvent is a hydantoin derivative having formula (VII):



(VII)

wherein R^{13}, R^{14}, R^{15} and R^{16} are each independently selected from the group consisting of hydrogen and C_1-C_6 aliphatic groups; and

wherein any C_1-C_6 aliphatic groups are optionally substituted with one or more hydroxyl groups.

12. The ink composition of claim 8 wherein the mixture of water-miscible organic co-solvents comprises a mixture of 2-pyrrolidone and di-(2-hydroxyethyl)-5,5-dimethylhydantoin.

13. The ink composition of claim 1 having a viscosity in the range of about 1.5 to 6 cps and a surface tension in the range of about 18 to 45 dynes/cm.

14. The ink composition of claim 1 having a viscosity in the range of about 2 to 3.4 cps and a surface tension in the range of about 21 to 37 dynes/cm.

15. The ink composition of claim 1 having a pH in the range of about 8 to 10.

16. The ink composition of claim 1 having a pH in the range of about 8.5 to 9.5.

17. The ink composition of claim 1 with the proviso that no surfactant is present in the ink composition.

18. A process for printing an image on a print medium comprising applying thereto an ink according to claim 1, by means of an ink-jet printer.

19. The process of claim 18 wherein the print medium is a plain paper or a coated paper.

20. An ink-jet printer cartridge containing an ink according to claim 1.